REMARKS

The Office Action dated December 27, 2007, has been received and carefully noted. The above amendments to the specification and claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-11, 13-17, and 19-22 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Claims 23-26 have been added. No new matter has been added. Claims 1-17 and 19-26 are respectfully submitted for consideration.

The disclosure was objected to because of certain informalities. Specifically, the Office Action asserted that in paragraph [0085] of the present application the content "The 1.2 dB amplification...during 5 frames (200 samples)" is inconsistent with the legend "subframe (40-samples)" in Fig. 8, wherein 5 (subframe) x 40 (samples) = 200 samples.

Applicant respectfully submit that the phrase "The 1.2 dB amplification...during 5 frames (200)" is fully consistent with the legend "subframe (40-samples)" in Fig. 8, with the exception of the term "frame" on page 19, paragraph [0085], of the present application. Thus, paragraph [0085], of the present application has been amended to replace "frame" with "subframe" in order to make the content of the application more consistent to Fig. 8. As such, it is respectfully requested that the objection be withdrawn.

Furthermore, the Office Action asserted that there is no equation label for Equation 2.14. The equation label "Equation 2.14" has been added to paragraph [0097]

of the specification. As such, Applicants respectfully request that the objection be withdrawn.

Moreover, the Office Action asserted that a legend such as "Prior Art" should be included in Fig. 1. Applicants respectfully traverse this rejection for the following reasons. Applicants respectfully submit that the Office Action did not establish that Fig. 1 is prior art. Nowhere does the specification describe that Fig. 1 is prior art. Thus, Fig. 1 does not need a legend such as "Prior Art." As such, Applicants respectfully request that the objection be withdrawn.

Further, the Office Action took the position that in claim 18, the limitation "said computer product comprises a computer-readable medium on which said software code portions are stored" is not disclosed in the specification. This rejection is respectfully traversed as follows.

The specification fully supports the limitation as discussed above. For example, paragraph [0026] of the present application describes that the invention may also be embodied as computer program product comprising portions for performing steps when the product is run on a computer. Thus, Applicants respectfully submit that the specification provides adequate support for the computer claims of the application.

The Office Action also took the position that in claim 19, the limitation "said computer program product is directly loadable the internal memory of the computer is not disclosed in the specification. This limitation has been added in the summary section

(paragraph [0026]) of the present application. In light of this amendment, the objection is rendered moot.

Claims 17 and 19-22 were rejected under 35 U.S.C. 101 because the claimed invention is allegedly directed to non-statutory subject matter. In response, independent claims 17 and 20-22 have been amended to change the preambles of the independent claims as shown in the claims section. Therefore, Applicants respectfully request that the rejection to claims 17 and 19-22 be withdrawn.

Claims 18 and 19 have been rejected under U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. With respect to claim 18, the Office Action asserted that the limitation "said software code portions" lacks antecedent basis. As discussed above, claim 18 has been canceled. With respect to claim 19, the Office Action indicated that the limitation "the internal memory" lacks antecedent basis. Claim 19 has been amended to replace "the internal memory" with "an internal memory." Therefore, Applicants respectfully request that the rejection to claims 18 and 19 be withdrawn.

Claims 1, 3, 5, 7, 9, 11, and 17 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2004/243404 to Cezanne et al. (Cezanne) in view of U.S. Patent Publication No. 2002/0184010 to Eriksson et al. (Eriksson). The Office Action asserted that Cezanne and Eriksson describe all of the elements of claims 1, 3, 5, 7, 9, 11, and 17. This rejection is respectfully traversed.

Independent claim 1, upon which claims 3-6 are dependent, recites a method that

includes determining a current first parameter value from an index corresponding to a first parameter. A coded audio signal comprises indices that represent audio signal parameters comprising at least the first parameter representing a first characteristic of the audio signal and a second parameter. The method also includes adjusting the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value.

The method additionally includes determining a current second parameter value from the index further corresponding to the second parameter. The method further includes determining a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, such that a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value.

Independent claim 2 recites a method that includes determining a current first parameter value from an index corresponding to at least a first parameter. A coded audio signal comprises indices that represent audio signal parameters comprising at least the first parameter representing a first characteristic of the audio signal and a second parameter. The method also includes adjusting the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value. The method additionally includes determining a new index value from a table relating index values to at least first parameter values, such that a new first parameter

value corresponding to the new index value substantially matches the enhanced first parameter value. The method further includes detecting a current background noise parameter index value. The method includes determining a new background noise parameter index value corresponding to the enhanced first characteristic.

Independent claim 7, upon which claims 9, 10, and 11 are dependent, recites an apparatus that includes a parameter value determiner configured to determine a current first parameter value from an index corresponding to a first parameter and determine a current second parameter value from the index further corresponding to a second parameter. A coded audio signal comprises indices that represent audio signal parameters comprising at least the first parameter representing a first characteristic of the audio signal and the second parameter.

The apparatus also includes an adjuster configured to adjust the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value. The apparatus further includes an index value determiner configured to determine a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, wherein a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value.

Independent claim 8, upon which claim 12 is dependent, recites an apparatus that includes a parameter value determiner configured to determine a current first parameter

value from an index corresponding to at least a first parameter. A coded audio signal comprises indices that represent audio signal parameters comprising at least the first parameter representing a first characteristic of the audio signal and a background noise parameter. The apparatus also includes an adjuster configured to adjust the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value.

The apparatus further includes an index value determiner configured to determine a new index value from a table relating index values to at least first parameter values, such that a new first parameter value corresponding to the new index value substantially matches the enhanced first parameter value. The apparatus additionally includes a detector configured to detect a current background noise parameter index value. The apparatus also includes a determiner configured to determine a new background noise parameter index value corresponding to the enhanced first characteristic.

Independent claim 13 recites a method that includes detecting a characteristic of an audio signal. A coded audio signal comprises indices that represent audio signal parameters. The method also includes detecting a current background noise parameter index value. The method additionally includes determining a new background noise parameter index value corresponding to the detected characteristic of the audio signal.

Independent claim 14 an apparatus that includes detecting means for detecting a characteristic of an audio signal. A coded audio signal comprises indices that represent audio signal parameters. The apparatus also includes detecting means for detecting a

current background noise parameter index value. The apparatus further includes determining means for determining a new background noise parameter index value corresponding to the detected characteristic of the audio signal.

Independent claim 15 recites a method that includes determining a current first parameter value from an index corresponding to a first parameter. A coded audio signal comprises indices that represent audio signal parameters comprising at least the first parameter representing a first characteristic of the audio signal, a second parameter and a background noise parameter. The method also includes adjusting the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value.

The method additionally includes determining a current second parameter value from the index further corresponding to the second parameter. The method further includes determining a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, such that a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value. The method includes detecting a current background noise parameter index value. The method also includes determining a new background noise parameter index value corresponding to the enhanced first characteristic.

Independent claim 16 recites an apparatus that includes parameter value

determination means for determining a current first parameter value from an index corresponding to a first parameter and for determining a current second parameter value from the index further corresponding to a second parameter. A coded audio signal comprises indices that represent audio signal parameters comprising at least the first parameter representing a first characteristic of the audio signal, the second parameter and a background noise parameter. The apparatus also includes adjusting means for adjusting the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value.

The apparatus further includes index value determination means for determining a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, such that a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value. The apparatus additionally includes detecting means for detecting a current background noise parameter index value. The apparatus includes determining means for determining a new background noise parameter index value corresponding to the enhanced first characteristic.

Independent claim 17, upon which claim 19 is dependent, recites a computer program embodied on a computer-readable medium comprising a program code configured to control a processor to execute a process of enhancing a coded audio signal comprising indices which represent audio signal parameters which comprise at least a

first parameter representing a first characteristic of the audio signal and a second parameter. The process includes determining a current first parameter value from an index corresponding to a first parameter. The process also includes adjusting the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value.

The process further includes determining a current second parameter value from the index further corresponding to a second parameter. The process additionally includes determining a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, such that a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value.

Independent claim 20 recites a computer program embodied on a computer-readable medium comprising a program code configured to control a processor to execute a process of enhancing a coded audio signal comprising indices which represent audio signal parameters which comprise at least a first parameter representing a first characteristic of the audio signal and a background noise parameter. The process includes determining a current first parameter value from an index corresponding to at least a first parameter. The process also includes adjusting the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an enhanced first parameter value. The process further includes determining a new index value from a

table relating index values to at least first parameter values, such that a new first parameter value corresponding to the new index value substantially matches the enhanced first parameter value. The process additionally includes detecting a current background noise parameter index value. The process includes determining a new background noise parameter index value corresponding to the enhanced first characteristic.

Independent claim 21 recites a computer program embodied on a computer-readable medium comprising a program code configured to control a processor to execute a process of enhancing a coded audio signal comprising indices which represent audio signal parameters. The process includes detecting a characteristic of an audio signal. The process also includes detecting a current background noise parameter index value. The process further includes determining a new background noise parameter index value corresponding to the detected characteristic of the audio signal.

Independent claim 22 recites a computer program embodied on a computer-readable medium comprising a program code configured to control a processor to execute a process of enhancing a coded audio signal comprising indices which represent audio signal parameters which comprise at least a first parameter representing a first characteristic of the audio signal, a second parameter and a background noise parameter. The process includes determining a current first parameter value from an index corresponding to a first parameter. The process also includes adjusting the current first parameter value in order to achieve an enhanced first characteristic, thereby obtaining an

enhanced first parameter value. The process further includes determining a current second parameter value from the index further corresponding to a second parameter. The process includes determining a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, such that a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value. The process also includes detecting a current background noise parameter index value, and determining a new background noise parameter index value corresponding to the enhanced first characteristic.

Independent claims 23 and 24 recite means-plus-function variation of one of the above claims. Independent claims 25 and 26 recite non-means-plus-function variation of one of the above claims.

As will be discussed below, Applicants respectfully submit that the cited references fail to disclose or suggest all of the elements of the present claims.

Cezanne generally describes voice quality enhancement that is performed directly on a bit stream of encoded speech. As described in paragraph [0039], of Cezanne, a fixed codebook excitation gain is extracted from a far-end bit stream and the fixed codebook excitation gain is increased (e.g., amplified) by the amount of a noise compensation gain to provide a modified fixed codebook excitation gain to compensate for the near-end noise. Finally, the original fixed codebook excitation gain is replaced with the modified

fixed codebook excitation gain. According to paragraph [0040], of Cezanne, it is sufficient to extract only the fixed codebook gain table indices and operate on the fixed codebook gain indices.

However, the Office Action acknowledged that Cezanne does not disclose "determining a current second parameter value from the index further corresponding to the second parameter," as recited in claims 1, 15, and 22. Thus, it is respectfully requested that the rejection of claims 1, 15, and 22 be withdrawn.

Moreover, Cezanne does not disclose or suggest "determining a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, such that a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value," as recited in claims 1, 7, 15-17, 22, 23, and 26.

In addition, Cezanne does not disclose "detecting a current background noise parameter index value, and determining a new background noise parameter index value corresponding to the enhanced first characteristic of an audio signal" as recited in claim 2, or "determining a new background noise parameter index value corresponding to the detected characteristic of the audio signal," as recited in claims 13 and 14.

Eriksson describes a network noise suppressor which includes means for partially decoding a CELP coded bitstream.

In paragraph [0057] of Eriksson, it is described that "In the described example, the fixed and adaptive codebook gains are coded independently. In some coding modes with lower bitrate they are vector quantized. In such a case the adaptive codebook gain will also be modified by the noise suppression. However, the excitation vectors are still unchanged."

However, Eriksson does not deal with a modification of the adaptive codebook gain together with the fixed codebook gain. In other words, Eriksson does not disclose "determining a new index value from a table relating index values to first parameter values and relating the index values to second parameter values, such that a new first parameter value corresponding to the new index value and a new second parameter value corresponding to the new index value substantially match the enhanced first parameter value and the current second parameter value," as recited in claims 1, 7, 17, 24, and 26. (Emphasis Added)

Moreover, Eriksson does not disclose or suggest, "determining a background noise parameter index value according to a characteristic of the audio signal," as recited in claims 2, 13, 14, 20-22, and 24-26.

According to certain embodiments of the present invention, a new gain index (new index value) minimizing the error between the desired gain $\beta \cdot \hat{\gamma}_{gc}^{old}$ (enhanced first parameter value) and the realized effective gain $\hat{\gamma}_{gc}^{new}$ (new first parameter value) according to Equation 2.12 or Equation 2.13 is determined according to the quantization

tables for the respective modes. The new fixed codebook gain correction factor (and the new adaptive codebook gain in case of modes other than 12.2 kbits/s and 7.95 kbit/s) corresponds to the determined new gain index.

The old gain index (current index value) representing the old fixed codebook gain correction factor $\hat{\gamma}_{gc}^{old}$ (current first parameter value) (and the old adaptive codebook gain g_{p_old} (current second parameter value) in case of modes other than 12.2 kbits/s and 7.95 kbit/s) then is replaced by the new gain index. See, paragraph [0095] of the present application.

Eriksson does not deal with determining a new index value (new gain index) by minimizing an error between the enhanced first parameter value (desired gain) and the new first parameter value (realized effective gain) such that no audible error is introduced to the new second parameter value (adaptive codebook gain).

As shown above, Eriksson does not cure the deficiencies of Cezanne. Thus, the combination of Eriksson and Cezanne fails to disclose or suggest all of the features of claims 1, 7, and 17. As such, it is respectfully requested that the rejection of claims 1, 7, and 17 be withdrawn.

Claims 3, 5, 9, and 11 are dependent upon claims 1 and 7. Accordingly, claims 3, 5, 9, and 11 should be allowed for at least their dependence upon claims 1 and 7, and for the specific limitations recited therein.

Claims 2, 4, 6, 8, 10, 12-16, and 20-22 were rejected under 35 U.S.C. 103(a) as being unpatentable over Allegedly Admitted Prior Art (AAPA). The Office Action

asserted that paragraph [0059] to [0064] of the present application is AAPA. This rejection is respectfully traversed.

According to certain embodiments of the present invention, a parameter value to be adjusted may be the comfort noise parameter value. Accordingly, a new index value $index^{new}$ is determined. In other words, a current background noise parameter index value index may be detected, and a new background noise parameter index value $index^{new}$ may be determined by adding $|4\log_2 \alpha|$ to the current background noise parameter index value index, wherein α corresponds to the enhancement of the first characteristic represented by the first speech parameter. See, paragraph [0140] of the present application.

Neither from Cezanne nor from Eriksson or from AAPA in the specification, it is derivable to determine a background noise parameter index value according to a characteristic of the audio signal.

Therefore, Applicants respectfully submit that Cezanne and Eriksson do not disclose or suggest the subject matter of claim 2, 13, and 14. As such, it is respectfully requested that the rejection of claims 2, 13, and 14 be withdrawn. In view of the above discussion, the claims are considered to be not obvious from Cezanne and Eriksson.

Furthermore, Applicants respectfully submit that the combination of Cezanne, Eriksson and AAPA fails to disclose or suggest all of the features of claims 8, 15, 16, and 20-22. Claims 4, 6, 10, and 12 are dependent upon claims 1, 2, 7, and 8. Accordingly,

claims 4, 6, 10, and 12 should be allowed for at least their dependence upon claims 1, 2, 7, and 8, and for the specific limitations recited therein.

Claims 18 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Cezanne in view of U.S. Patent Publication No. 2005/0071154 to Etter (Etter). This rejection is respectfully traversed.

Etter generally describes estimating noise in a speech signal using only the excitation value of the speech signal. Etter does not cure the deficiencies in Cezanne. Thus, Applicants respectfully submit that the combination of Etter and Cezanne fails to disclose or suggest all of the elements of claim 17.

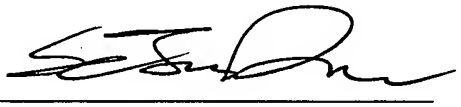
Claim 19 is dependent upon claim 17. Thus, claim 19 should be allowed for at least its dependency upon claim 17, and for the specific limitations recited therein.

For the reasons explained above, it is respectfully submitted that each of claims 1-17 and 19-26 recites subject matter that is neither disclosed nor suggested in the cited art. Also, it is respectfully submitted that the subject matter is more than sufficient to render the claimed invention unobvious to a person of ordinary skill in the art. It is, therefore, respectfully requested that all of claims 1-17 and 19-26 be allowed, and that this application be passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Sejoon Ahn
Registration No. 58,959

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

SA:dc

Enclosures: Additional Claim Fee Transmittal
IDS, PTO-1449, 3 References
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